FOREWORD

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USSR Industrial Development

SOVIET NONFERROUS METALLURGY

No. 61

This serial publication contains translations of selected articles on nonferrous metallurgy in the Soviet Union, on the specific subjects indicated in the table of contents. Complete bibliographic information accompanies each article.

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EXPEDITE THE CONSTRUCTION OF THE KIROVABAD ALUMINUM PLANT

[Following is a translation of an article by Z. Yelizarov and A. Krichevskiy in the Russian-language newspaper Stroitel'naya Gazeta (Construction Gazette), Moscow, 24 Feb 1963.]

The first builders arrived at the future site of this plant seven years ago. The country's map has changed greatly since then, but our plant still is uncompleted. The latest schedule (by now again postponed) called for completing the first section of this enterprise by the fourth quarter of 1963.

But how could this be seriously considered in view of the fact that less than one-half of the scheduled 1,700 units of equipment was delivered, and the 1963 plan calls for delivery of 153 units? No slide rule is needed to show that a major oversight was committed here. But those who attempted to discuss this were shushed.

The Ministry of Construction Azerbaydzhan SSR, from all appearances, hoped for "luck," and thus, for the sake of a formal fulfillment of the plan, secondary operations were performed on many sectors. Thus, at the leaching unit, enormous tanks were installed and chemically treated, although everybody knew that they were empty, requiring stirring mechanisms and extensive finishing.

By the beginning of 1963 not one of the more than 100 primarily scheduled sectors of this project was completed and released to the customer. Nearly six million rubles in investments are yet to be implemented, mainly in equipment assembling. There still have been no deliveries of contact apparatus, a large number of electric precipitators, tens of ventilators, acid-pipe fittings, ball mills, elevators, and a car dumper.

Responsibility for these deliveries belongs to the Azerbaydzhanian Sovnarkhoz, represented on this site by the management of the future enterprise, headed by Comrade Sultanov. Appointed seven years ago,

this management has strictly delineated its own duties. They are in no hurry to sign various papers, and among them there are few mechanical engineers. To solve the problems that arise, the management usually calls in specialists from Moscow, Rostov-on-Don, and Ordzhonikidze.

Consider such a fact: the explanatory note about the facilities scheduled for primary completion, with a revised list of equipment, was drafted and transmitted to the builders as late as at the end of July 1962, that is, several months prior to the official opening date of the plant. In other words, much was done without precise calculations, in the dark as it were.

As a result it turned out, for example, that two, instead of three, production lines will be put into operation at the sulfuric-acid shop. But the builders distributed the materials and equipment among three lines. Not one of these lines has yet been completed. Such a snag could have been easily avoided!

The story of the car dumper is very dismaying. The footings laid for it, at the cost of tremendous efforts and resources, proved to be unsuitable. Similar unpleasantries also were experienced by the builders of the decomposition and leaching unit and the leaching unit.

A few words about the team of designers working for the plant management. Its incompetence and indecisiveness have become the talk of the town. Tens of problems have to await solution for months, because the design institute at Leningrad has to be consulted even on minor matters. This is even becoming a curiosity: for a long time the local comrades cannot decide by themselves what color the decomposing units should be painted. It is high time to establish a strong team of designers at the plant.

Of course, the builders also bear the fault for the disruption of the construction schedule. The year did not end pleasantly for Trust No 3 and its subcontractors. A report about the missing equipment, components, and motors was compiled two months ago. It took 12 pages of close print. The contents of this document is known to both the republic gosplan and the sovnarkhoz.

At the November Plenum of the CC CPSU Comrade Khrushchev declared that the plans of production and capital construction are poorly coordinated with the plans of material-technical supply. The construction of the Kirovabad Aluminum Plant is a graphic example. From this bitter fact the most serious conclusions should be drawn.

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INTRODUCE OXYGEN AT THE BALKHASH MINING

AND METALLURGICAL COMBINE

[Following is a translation of an article by M. Samarin in the Russian-language newspaper Kazakhstanskaya Pravda, Alma-Ata, 19 Feb 1963.]

Every specialist with whom I started talking about utilizing oxygen in copper production would ask me:

"Why do you want to know?'

"I'm writing a report..."

"Better not. The subject is too delicate."

The subject indeed did not prove to be very easy. Everyone knows that the use of oxygen in the production of copper is definitely a progressive innovation, but why has so little been done about it? Let us consider the facts.

We will begin with past history. Oxygen in the production of copper is something new. Originally both scientists and practitioners believed that a simple increase in oxygen content will suffice to perform the process of matte converting on the basis of oxygen-enriched blowing. So it was decided to build an oxygen plant.

In 1958 such a plant was built at the Balkhash Mining and Metallurgical Combine at the cost of more than a million new rubles.

The tests began. They took four stages: two months each in 1958 and 1959 and three to four months each in 1960 and 1961. They were performed with the participation of scientists from the Moscow Gintsvetmet Institute, the Urals Affiliate of the Academy of Sciences USSR, and the Institute of Metallurgy and Beneficiation of the Academy

of Sciences Kazakh SSR. It was established that the productivity of converters increases in direct proportion to the increase in oxygen content, but at the same time the wear of their lining sharply increases and the cost of copper rises -- by approximately 500,000 rubles annually. For while the inter-repair period for converters with conventional air blowing lasted four months, for the converters with oxygen blowing it lasted only three months. Moreover, air is free, whereas oxygen cost money.

The copper producers urged the scientists to develop more durable refractories for converter lining, capable of enduring temperatures of more than 1,300°C, to develop new techniques, and to perform thermotechnical and technical-economic calculations.

In 1960 the Gintsvetmet in collaboration with the Institute of Metallurgy and Beneficiation of the Academy of Sciences Kazakh SSR proposed a new lining material: periclase, spindellide brick. But industrial tests showed that its resistance increases only during the first period of converter operation, while during the second period it burns out just as rapidly. This led to a new problem: either more durable refractories are developed, or the excessive rise in converter temperature must somehow be controlled, or both.

Time passes, but no actual progress has been made. As for the oxygen plant, in the four years of its existence it has operated only 11 months, and since April 1961 it has generally been under lock and key. It is now like a "cataract" in the eye of the State Committee for Ferrous and Nonferrous Metallurgy

In January the Balkhash Combine was the site of a consulting conference attended by the Senior Engineer at the Administration of Nonferrous Metals under the Karagandinskiy Sovnarkhoz K.V. Martynov, the Director of the NIItsvetmet Institute A.P. Smirnikov, the Senior Scientific Co-Worker at the Gintsvetmet Institute A.P. Bochkarev, the Senior Project Engineer at the Giprotsvetmet B.A. Trista, and the head of the Giprotsvetmet team V.S. Bibenin. For a week they sat in session, pondered, and talked about what should be done with the oxygen plant.

These discussions gave birth on 2 February 1963 to yet another document. It declared that the oxygen plant at the Balkhash Mining and Metallurgical Combine should best be utilized for oxygen-suspension smelting in reverberatory furnaces (notice that converters are no longer mentioned), and suggested the construction at the combine of a large-size pilot furnace for this purpose. Aware that this will not be cheap, the conference participants cited arguments in support of their proposal. They argued that oxygen-suspension

smelting will make it possible to obtain a gas containing 70 to 80 percent sulfur dioxide, to increase the output of sulfuric acid, to raise the copper content of matte by an average of four to six percent for the shop as a whole, and to increase the productivity of the converter process. Moreover, this would be a maneuverable furnace, which will provide the conditions for a more efficient utilization of the principal reverberatory furnaces.

Facinating? Yes. The workers of the plant do not object to this solution. We have merely one reservation against the VNIItsvetmet, which first insisted on building a pilot semi-industrial furnace of a much smaller size and now insists on a much larger furnace. Apparently, the metallurgists were right when they said that all this fuss was in the first place completely unneeded, as the cost difference is small.

But the metallurgists have also an important question: what will be the economic benefits of oxygen-suppension smelting? This should have been calculated by the Gintsvetmet Institute as far back as last year, but it did not attend to this.

The chief project engineer at the Giprotsvetmet B.A. Trista commented on this matter:

"The economic expediency of using oxygen in reverberatory furnaces is highly dubious. I believe that the processing cost will then even increase."

Time will show whether Comrade Trista was right. One thing is clear: the metallurgists may not, and have not the right to, rush blindly into this matter.

The aforementioned document suggests testing oxygen in such technological processes as the firing of anode furnaces, oxidation of impurities during the pyro-refining of copper, dissolution of granules in the production of copper sulfate, decopperization of electrolytic-bath slime, and fluidized-bed roasting of molybdenum intermediates. This enumeration alone indicated the broad range of uses to which oxygen can be put at the Balkhash Mining and Metallurgical Combine once the scientists and production men combine their efforts.

How do the metallurgists themselves look at the future of oxygen? This is not an idle question, Its clarification will help us understand why the introduction of oxygen in the production of copper has been so slow and what should be done to speed it up.

The chief engineer at the combine Yu. K. Pobedonostsev said: "Why should we use oxygen when we could, without any expenditures, increase converter productivity by 15 percent, by means of conventional air blowing."

The director of the combine P.P. Matyushin continues this argument: "Oxygen will be advantageous to us only after we completely utilize our reserve capacity and the plan of copper output is increased."

So that explains it: the combine still operates at below capacity. This is precisely one of the reasons for the exceedingly chilly attitude of its heads toward the introduction of oxygen into ther operations of copper production.

From all this two conclusions should be drawn. To accelerate the introduction of oxygen into the metallurgy of copper, first, the scientific research work in this field must be maximally intensified and, second, the capacity of the combine must be completely utilized. And then all will be well.

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ELIMINATE POWER SHORTAGES AT THE BALKHASH MINING AND METALLURGICAL COMBINE!

[Following is a translation of an article by M. Samarin in the Russian-language newspaper Leningradskaya Pravda, Leningrad, 16 Feb. 63.]

"The shortage of electric power and process steam is endangering the very life of our enterprise."

When the director of the Balkhash Mining and Metallurgical Combine P. P. Matyushin stated this from the tribune of the oblast industrial Party conference, I thought that he only said it "for effect." But now I'm at Balkhash. I spoke to the deputy chief power engineer at the combine L. I. Loner, the senior power engineer A. N. Budanov, and the powerhouse director I. M. Ivashevskiy, and visited the shops, and I ascertained that the director of the combine was not exaggerating.

This huge industrial complex in Balkhash, in the Karagandinskiy Economic Region, whose performance affects many of the nation's enterprises, is treated like a pariah so far as electric power supply is concerned. Its copper smelting facilities, electrolysis shop, and other important services are hobbled by a perpetual shortage of electric power and process steam. Thus it is not possible to perform current repairs of the existing powerhouse facilities, let alone capital repairs. All these facilities are operated to their very limit. If something breaks down, the production of copper is immediately affected. For example, the old turbine No 3 broke down last December. While it was being repaired, the combine underfulfilled a large number of technical-economic indexes, its plan of copper output for the year was jeopardized, and it sustained substantial losses.

I. M. Ivashevskiy said that much of the power equipment operates on an emergency basis, but is not allowed to be shut down as there is no reserve equipment. In boiler No 3 the tubes burned out and water is leaking, but there is no time to repair the defect. To somehow save this boiler the power engineers had to install a temporary screen to divert hot water.

A great deal of interesting work is under way to replace the mechanical AC transducers by silicon rectifiers, at the combine. This is a means of considerably expanding the output of refined copper. Three additional silicon rectifiers were ordered from the Glavkomplekt, but the Karagandinskiy Sovnarkhoz revoked this order. This is said to have been done on the initiative of the Chief of the Administration of Nonferrous Metallurgy I. G. Mekler. May we ask what this is? ignorance or disbelief in new technology?

Steam is a major factor in copper production. But it is in short supply. The hourly steam output of the boilers is five tons lower than scheduled, and so many production lines have to be kept on "starvation rations," and the introduction of new technology is hampered. Consider that the separation of copper-molybdenum concentrates alone would save considerable amounts of sodium sulfide, which meanwhile we have to purchase abroad.

How could such an energy-consuming production find itself in essentially so deplorable a condition?

Though the builders may be accused, it is primarily the management of the combine that is responsible. For until recently the powerhouse was part of the combine -- and the boilers for process steam remain operated by the combine to this very day.

This is no reflection on the director of the combine, Matyushin, because he is a newcomer, recently appointed to his post. What is more, Comrade P. P. Matyushkin, on discovering this grave deficiency, rang the alarm. The inadequate development of power-generating facilities is directly associated with the technical policy of the chief engineer at the combine Yu. K. Pobedonostsev. He could not be blind to what was going on. He should have halted the work on other projects and constrained the Pribalkhashstroy Trust to focus on expanding the power facilities. But Pobednostsev was not sufficiently demanding toward the builders. The chief

engineer was more concerned with expanding the capacities of the production lines and left the auxiliary services to shift for themselves, underestimating their importance. The retribution has not failed to come: now, due to the power shortage, the combine is in mortal danger.

The personnel of the Pribalkhashstroy began to expand the Balkhash Powerhouse four and one-half years ago. It is difficult to find words to describe fully the "activity" of the builders. Is it not the height of fecklessness to have worked those four and one-half years without adding even a single kilowatt to installed capacity?! The assembling of a boiler and turbo-generator, pursuant to norms of the Gosstroy USSR, should take four months, but the Sredazenergomontazh assembling administration (Chief Comrade Ivlev) has been assembling these relatively small units for more than two years now.

Soon the sixth turbine and generator should start operating. But not one assembling organization is operating on schedule. The turbine still has not been tested. The boiler was fired up with fuel oil alone, without pulverized coal, and it cannot reach the required capacity. The concerned sector of the Sredazenergmonotazh (Chief A. G. Sidel'nikov) has not even started assembling the fuel-feed conveyers, although it is already far behind schedule.

The sector of the Kazelektromontazh is lagging greatly. Of the 48 types of operations it failed to fulfill 15. The chief of this sector V. A. Andreyev complained about the manpower shortage. This is partly true. The electrical installers at Balkhash are carrying out a huge volume of operations. Their annual program exceeds one million rubles. It should long ago have been handled by an entire administration instead of a sector. But neither the Kazelektromontazh Trust nor the republic Ministry of Construction have decided this topical problem.

The heat insulation installers are working very unsatisfactorily. The sector chief I. D. Bychkov admits that its personnel are 20 days behind schedule. The main reason: the Temirtau Administration of the Kazteploizolyatsiya does not provide the sector with the necessary materials and manpower.

The specialized organizations of the Ministry of Construction Kazakh SSR which operate in Kazakhstan have limited capacities and lack mutual coordination. The

construction of the entire combine, and not merely of the powerhouse, was farmed out to senior construction superintendents, some of whom, moreover, lack sufficient experience. It is said that the situation had been better while a representative of the ministry was present at Balkhash, but now he has left for Alma-Ata.

The sixth section of the powerhouse will probably start operating by the end of March. But the turbine will work in a unit with a single boiler, only at one-third capacity. This will hardly relieve the tense situation. The work on the seventh boiler, which has already undergone preliminary hydraulic tests, must be expedited. This boiler could start operating at nearly the same time as the sixth turbo-generator. That already could provide greater relief.

However, the Karagandinskiy Sovnarkhoz and the republic gosplan decided to have the seventh turbine and the eighth boiler put into operation as late as the third quarter of the year. Such planning, if it can be called planning, disorganizes the builders and installers.

The Karagandinskaya Oblast Industrial Party Committee is perfectly justified in raising the question of accelerating the assembling of this equipment. The combine should no longer be kept on "starvation rations." The original mistake should be rectified as soon as possible.

A few words about steam. In 1959 a waste heat boiler with a steam output rate of 55 tons per hour was installed at the combine. Almost everything was installed, even automatic devices, and only a few trivial operations remained to be done. Yet the boiler was abandoned. It was left idling and unattended for several years. The fittings began to rust. The instruments were removed. If it is not stupid bungling, what else can it be?

The Balkhash Mining and Metallurgical Combine should have a reliable power supply. This is a burning problem of the present, not of the future. A major role in the ultimate solution of this highly important problem will be occupied by the rate of construction of the Karaganda--Balkash high-tension line. The poles of high-tension lines already run across the steppe, and it is not unlikely that during this coming fall they will reach Balkhash. But after they do, they will stand idly, because two design institutes -- the Rostov Teploenergoproyekt and Moscow Giprotsvetmet --

are disputing whether electric power should be supplied by the existing powerhouse or by a separate substation still to be built. The combine supports the latter alternative. It is more reasonable, if only because high-tension lines would then not run through the area of the combine. But meanwhile the dispute still goes on, the matter stands still, and no one is attending to designing the substation.

Is it not time for the persons in charge to put an end to this excessively protracted dispute?

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ADVENTURES OF THE INVENTOR YURCHENKO

[Following is a translation of an article by A. Avdeyenko in the Russian-language newspaper Trud, Moscow, 10 Feb 63.]

The favorable headwind of wartime front brotherhood propelled into my house Ivan Fedotovich Yurchenko. How many summers and winters have passed since we met last while I was a war correspondent and he a Red Army soldier, the possessor of golden hands, a clever mind, and a fertile brain! Yes, Ivan Yurchenko was exactly that during the war years. He was a most capable soldier and jack-of-all-trades. Clean the burp gun? Allow me, I'll take care of it. Repair a damaged machine gun? Can be done! Play a violin? With pleasure! Construct an accordion? I'm not sure, but let me try. He tried -- and made not just one but three accordions. And they all sounded no worse than factory-made accordions. Grasp the fine points of a foreign-made camera, radio receiver, or instrument? Let me! Improve the performance of the army field bakery, make it more transportable? That is hard, it takes time, but it can be done.

Ivan Yurchenko was on familiar terms with any machine and he solved with amazing speed the most challenging technical puzzlers, although he lacked special education.

Talent? More than talent. This is a spark of the agelong and eternal genius of the Russian people.

Such was my front buddy Ivan in our youth, 20 years ago. And now?

His appearance has not changed one iota: tall, broad-shouldered, modestly silent, but not timid nor bashful, with lumbering movements, and seemingly not a day older.

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And his golden hands?

"How are you, Ivan?" I asked. "What are you doing now?"

He replied musingly: "I'm not living it up too much. My hearing has worsened, and my vision also grew poor. Both feet are a little lame. As for work... I putter around." Ivan winked slyly and in an offhand manner touched the gold medal shining on his chest.

Honored Inventor of the Ukraine! Splendid. Come on, friend, do tell me how did you merit the glory and love of the Homeland?

Ivan Fedotovich narrated for a long time the beautiful story of his postwar life. Reader, I will now describe to you only one of its principal episodes.

At the November Plenum of the CC CPSU Khrushchev declared: "Technical progress is that key position by means of which we can solve the tasks of creating the material-technical base of communism and achieving a higher labor productivity."

Ivan Fedotovich Yurchenko from his first day of work at the Zaporozh'ye Refractories Plant occupied such a key position. With his inexhaustible talent, inventiveness, and labor enthusiasm, he thought up and built a miracle machine intended to accomplish a revolution in the refractories industry.

The design of the fitter Yurchenko even in its original, and far from perfect, form, drawn by a not very skillful hand, was liked by the director of the plant Petr Alekseyevich Mitin. He approved it and predicted a splendid future for it. But the chief engineer at the plant, Starun, denounced this design as incompetent and worthless and absolutely rejected it. So absolutely that he even did not permit his subordinates to register, in accordance with the normal procedure, Yurchenko's creative suggestion at the plant "briz" [office for the promotion of industrial efficiency and inventions]. Those were the overt actions of Starun. But there were also covert actions. With the assistance of the engineers Shtepu and Volpyanskiy, Starun hastily copied Yurchenko's blueprints and, on signing to it his own name and the names of his accomplices -- I beg pardon

-- his "co-authors," he ordered the "briz" to immediately register "his" invention. Starun acted energetically, losing no time, but all the same he met with defeat.

Ivan Yurchenko guessed Starun's intentions in time. Despite the latter's prohibition, Yurchenko drafted and had registered his "object of invention" a day ahead of the "authors' collective." The fitter's priority was easily proved. Starun's hardly decent behavior also was proven. He had to leave the plant immediately. Yurchanko's remarkable invention was granted the right to exist.

Is that all? Did Ivan Yurchenko win? Alas, that was only the first obstacle to be overcome. The hardest combats were still ahead. But do not complain about your fate, O volunteer-soldier. You march in the vanguard of the labor front, you occupy the key position of communism. You chose it yourself. The position befits the soldier.

Soon new battles broke out for Yurchenko's miracle-machine at Moscow and Leningrad.

The All-Union Scientific Research Institute of Refractories at Leningrad.

How did its staff react to the invention? Did they gladly welcome the fitter-repairman who lacked special education? Did they offer him their facilities, longtime experience, and creative collaboration?

Not at all.

The institute categorically rejected Yurchenko's design, which was sent to it by the Committee for Inventions and Discoveries under the Council of Ministers USSR, for consultation.

This brutal rejection did not discourage Ivan Fedotovich. He continued to work on the press, to improve it, and to acquire a growing number of friends and helpers.

* * *

The most faithful friend of the inventor proved to be the director of the plant, Engineer Petr Alekseyevich Mitin. He believed in Yurchenko's press and decided to have it constructed. He summoned the chief of machine shops, Engineer Zhuravlev, and declared:

"Look, Boris L'vovich, here are the blueprints and the money for expenses: go ahead and build the press. But without detriment to the basic production work. If you need help, call me, any time."

Why did the director of the plant believe in a rank-and-file fitter from the chamotte shop? Because he had long known Yurchenko well. Almost immediately on starting work at the machine shop, the fitter designed various contraptions for his working post and began to fulfill his monthly quota in three days. Subsequently he invented shears that could cut through sheet steel as much as six millimeters thick (previously sheets that thick were cut by hand chisels or in the best case by oxy-acetylene torch). Ten cutters were thus relieved for other work, and the productivity on this sector climbed sharply.

The director, perceiving Yurchenko's talent, transferred him to the chamotte shop, which afforded greater scope for his creative gifts. And indeed, on his new post, Yurchenko's talent began to sparkle.

The shop contained antediluvian presses for the compression molding of plastics -- inefficient and terribly obsolete. They demanded great effort of their attendants. Upon observation, Yurchenko improved a few things, eased the working conditions of attendants, developed a convenient and precise tool, and altered the old "cart" on which molds were conveyed from the fitting table to the press. This small innovation made it possible to reduce to approximately one-third the normal mold replacement time.

A team of engineers tried to modernize the basic press, the SM-143, but failed. Then Yurchenko tackled this problem. The fitter-adjuster took over the direction of the project and completed it. The press was fitted out with special attachments and put into operation with splendid results. Instead of 600 ladle stoppers per hour it began to stamp out 3,000. It was also demonstrated that the conversion from the old pressing method to the new and most progressive semi-dry method can be accomplished on a broader scale, with greater prospects, and more boldly.

That was when, while operating the new press, Yurchenko conceived the idea of developing a fundamentally new press, changing radically the production of steelworking presses.

* * *

And so the director of the plant assigned Engineer Zhuravlev, the chief of machine shops, and mechanics and fitters, to another project. In three months, they built a half-life-size PPYu-1 press [initials refer to Yurchenko's semi-dry pressing press].

From the very first day the PPYu-1 began to produce steel-casting accessories that are urgently needed by metallurgical plants. Intricate components began to be fabricated by the semi-dry method, by-passing a chain of no longer necessary operations. Two workers and one stand-in worker now produce several times as much output as was previously produced by 22 workers. Labor productivity increased eight times, and the heat resistance of the products -- at least three times.

By now three Yurchenko presses are operating at the Zaporozh'ye Refractories Plant. The second is larger and better than the first, and the third is better than the second. In 15 months the second press produced approximately 22,000 tons of steel-casting accessories, nearly twice as much as the first press. On the third press Yurchenko installed additional attachments. They can press-mold particularly intricate refractory products -- the so-called end siphons with longitudinal and transverse apertures. The press lacks even a single bearing made of expensive and scarce nonferrous metals (the new Yurchenko-designed bearings are of steel and are inexpensive and perform irreproachably). An automatic lubricating system was installed. The table on which the parts are molded now moves at a faster rate than previously.

Yet another highly important feature was that whereas the old method of producing steel-casting accessories was labor-consuming and inefficient and required repairing the presses twice a year, Yurchenko's presses require no overhaul for a long time.

Unfortunately, the Committee for Inventions and Discoveries, or more exactly Engineer Korotkov, for a long time displayed the most adamant resistance to not only the first creative suggestion of Yurkevich (the blueprints were categorically rejected and filed with the notation "Not to be examined"). His second invention also met with disapproval. And the Leningrad refractories expert-scientist, chief of a design bureau, Bernshteyn to this very day declares irritably that he will not support the "defective, groundless"

inventions of the unschooled fitter (Bernshteyn himself after five years still has not succeeded in developing the press he had promised).

But happily there exists a broader world besides Korotkov and Bernshteyn. It is not they who determine the nation's technical policies.

The State Committee for Automation and Machine Building appreciated the talent of the workingman. The engineer-machine builder A. P. Yepseyev and the chief specialist for refractories P. A. Ivlev examined the blueprints and description of the PPYu-1 press and asked the plant for additional documents and praised highly Yurchenko's invention. This testimony played a decisive role.

The Committee for Inventions and Discoveries under the Council of Ministers USSR also evaluated highly the creative suggestion. The object of invention submitted was approved. Yurchenko was granted an author's certificate which specified that the object of invention is subject to immediate introduction. The road to every machine-building and refractories plant in the nation was opened for the PPYu-1 press.

Yurchenko met with ardent support also from the All-Union Society of Inventors and Rationalizers, and the press.

Ivan Fedotovich Yurchenko became the pride of not only Zaporozh'ye but also the entire Ukraine. Many plants are requesting the blueprints of the PPYu-1 press. Yurchenko's press is becoming popular at the Donbass, the Kondrat'yevskiy Plant, the neighboring Konstantinovka, Voronezh, a Semiluki plant, and the capital of metallurgy -- Magnitogorsk. Its fame has reached beyond our frontiers. Presses of this type began to be exported to many countries.

Thus, the creative idea, persistence, and labor of the innovator and his friends did finally win.

Comrade Yurchenko, courageous soldier of the Seven-Year Plan, your key position is invincible!

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A PRIVATE JEWELRY ENTERPRISE IS DISCOVERED AND SHUT DOWN

[Following is a translation of an article by V. Yeremenko in the Russian-language newspaper Leninskaya Smena (Lenin's Successors), Alma-Ata, 12 Feb 63.]

A traveling session of the Judiciary Collegium for Criminal Cases under the Supreme Court RSFSR was held at Sverdlovsk under the chairmanship of Justice of the Supreme Court RSFSR I. N. Karasev. On the bench of the accused was a large group of hardened criminals, rogues, speculators, and dealers in foreign currency.

The proceedings are described below.

* * *

The fame of the superb precious stones of the Urals has long spread beyond the spurs of the gray mountains. The collectives of the Sverdlovsk Jewelry and Lapidary Factory and the Russian Precious Stones Plant are the legitimate successors of the Ural stone-cutters and jewelry arts acclaimed by P. Bazhov.

Recently, however, these enterprises encountered a competitor. He began to fabricate the same products -- gold bracelets, rings, medallions, precious-stone earrings. True, there was no identifying signboard on the building of the competing enterprise and its address was not to be found at the address bureau nor in the local telephone directory. The point is not that the founders -- the old gypsy Said Ogly and his sons Nikolay and Platon -- mistrusted advertising. It is simply that for quite obvious reasons they wished to remain incognito.

But how did this underground enterprise find the raw materials and skilled personnel?

A major supplier was a S. I. Baranenkov. This swindler, who had spent many years in jail, on being freed, settled near the Magadan Placer Deposits where, with the help of dishonest people, he extracted the precious material and dispatched it to Sverdlovsk and other cities. In two years this hardened criminal, with the assistance of certain workers of the Burkhala and other gold mines who lost their conscience and honor, stole from the State 29 kilograms of gold.

The workers for the newly appeared "firm" also were found. They were the foremen at the Sverdlovsk Jewelry and Lapidary Factory N. F. Lomayev and G. A. Zarovnyatnykh. They worked for Ogly during their, so to speak, off-duty hours.

The jewelry business was not the only source of income for the firm of "Ogly and Sons." The enterprising businessmen derived most of their capital from speculation in gold. Gold continued to flow in there through the same murky channels from not only Siberian but also Ural mines. Gold dust and nuggets from the Miass and Saldinskiy placer mines were supplied by their former employees Yu. Sharkov, V. Vakhitov, and others.

The Lenskiy Mine was ruled over by a gang headed by the thief I. Cherepovskiy. The vaults of Said Ogly received gold through middlemen -- the employees of the Sverdlovsk Jewelry and Lapidary Factory B. Lerman, G. V'yunov, and N. Yekaterinskiy. These rogues lined their pockets with commissions of more than one thousand rubles.

Ogly and his sons carried gold and gold articles to Georgia, Armenia, Central Asia, the Baltic Seacoast, and the Ukraine.

But suddenly the gold "firm" went bankrupt. Its ringleader was arrested when he arrived at the Saldinskiy Mine to pick up another shipment of the expensive commodity. In the Urals and other regions of the country 68 gold thieves, fences, and currency speculators were arrested. They all now faced the court.

No one doubts that these dangerous criminals will be punished with all the strictness of the Soviet law. What is

more disturbing is that such grand larcenies were possible due to the inattention and irresponsible attitude of a number of heads of mining enterprises at which thievery flourished for so many years.

The terse address of the prosecution notes that the court should indict severely not only these dangerous criminals, plunderers of public property, but also the irresponsibility, insouciance, and lack of control.

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CSO: 1830-N

ION EXCHANGE RESINS ARE PRODUCED AT THE KARBOLIT PLANT

[Following is a translation of an article by A. Syrovatkin in the Russian-language newspaper Leninskaya Smena (Lenin's Successors), Alma-Ata, 19 Feb 63.]

The rivulet is straddled by latticed structures resembling a hydroelectric power station. From time to time, workers raise from the dam enormous trays and remove from them gold, silver, and other metals. You will think it a fairy tale? No! That is how will operate the ion exchanger combine, which will collect dissolved metals and other substances from river water.

The chemists of the Kuznetsk Basin discovered yet another miracle property of black coal. They found that this blood brother of diamond can be transformed into ion exchange resins. Ion exchangers are atoms charged with electricity. In water or any other solution -- sugar syrup, wine, or fungus mold -- these atoms are active and constantly strive to exchange places with the corresponding but less active atoms of the solution. On investigating the nature of ion exchange, the chemists developed resins with specific selective properties. Ion exchange resins are glass-like minute crystals resembling granular fish roe. These crystals are artful "craftsmen." They soften hard water, and therefore, for example, less soap is needed for laundering and fabrics become longer-wearing. At one time physicians requested the chemists to develop a resin which would select streptomycin from the fungus mold. The crystals were prepared. It turned out that, in addition to streptomycin, the fungus mold also engenders vitamin B, extremely valuable to human health. The chemists also developed ion exchange resins for trapping vitamins.

The Karbolit Plant has built a ion exchange resins shop. Here tons of the miracle crystals are already being produced.

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THE USES OF SYENITES

[Following is a translation of an article by M. Darbinyan in the Russian-language newspaper Kommunist, Yerevan, 8 Feb 63.]

Few have not heard of the silvery-blue miracle metal, which is widely used in the manufacture of aircraft, rolling stock, machinery, and machine tools. It is three times as light as iron, and its alloys with magnesium and some other metals are very little inferior in strength to steel. Many have, of course, guessed by now that we are speaking of aluminum, widely encountered in nature.

This metal is encountered in large quantities in the form of alumina (aluminum oxide) in clays and alumosilicates and, lastly, bauxites, where its content reaches 50 and more percent. In the Armenian SSR metallic aluminum is produced at the Kanakerskiy Aluminum Plant, but from Ural and Tikhvin aluminas rather than from local raw materials. Armenian geologists have long been engaged in prospecting for local aluminum-bearing materials. Many deposits of alumina-bearing highly silicaceous rocks have been discovered. But due to their low alumina content, they have not been directly utilized industrially.

The problem of obtaining alumina from local raw materials was tackled by the technologists of Armenia headed by M. G. Manvelyan. Since no bauxites -- the normal raw material for the production of alumina -- have been found on the area of the republic, scientists began to investigate highly silicaceous materials that contain alumina (nepheline rocks, Tumanyanskaya fireclay, and alusites, anorthosites, and the ash of Tkvibuli coal). Of the rocks investigated, nepheline syenites, which occur in the form of

large inexhaustible massifs in Armenia, proved to be the most promising.

Nepheline syenites are a complex material which contains approximately 56 percent silica, a large amount of alumina, alkalis (potassium and sodium oxides), etc. The total content of alkaline alumosilicates, which are the principal souce of alumina and alkalis, in the rocks is 85 to 90 percent. In addition, these syenites contain other minerals as well.

With such a low content of alumina these syenites cannot, of course, stand competition with the high-alumina bauxites if the normal methods of alumina recovery are used. But in addition to alumina, nepheline syenites contain a large amount of alkali oxides and other useful components which also can be isolated and utilized in the alumina industry.

On this basis, the investigators worked with the aim of developing a comprehensive and economical method of processing nepheline syenites.

On the basis of the technology worked out by Corresponding Member of the Academy of Sciences Armenian SSR M. Manvelyan and his co-workers, the Razdan Mining and Chemical Combine, now under construction, will obtain the following principal products: alumina, portland cement, potash, sodium metasilicate, calcium metasilicate, carbonized calcium metasilicate, yerevanits of different compositions, and pure silica.

The method of comprehensive processing is fundamentally reduced to the following. The nepheline syenites coming in from the quarry are subjected to crushing and pulverization. The pulverized material is processed into a slurry which consists of one part of syenites by weight to every three parts of an alkali solution (mixture of sodium and potassium alkalis) by weight. The slurry is charged into autoclaves and subjected to alkali treatment at high temperatures and pressures. Under the action of the alkali solutions of potassium and sodium, the silica part of the material selectively goes over into the solution so that the residue becomes alumina-rich. The filtration of the autoclave solution yields a new precipitate -- a concentrate with a high content of alumina and relatively low content of silica and -- the alkali-silica solution, whose cooling results in the precipitation of a crystalline substance, namely, sodium

metasilicate. Farther on, the sodium metasilicate (upon dissolution in water and treatment with carbon dioxide from the kilns), is processed into a homogeneous mixture of soda and silica -- a highly valuable raw material for various branches of industry, called "yerevanit." This process also yields raw silica -- "white lampblack."

The residue of the alkali solution after the isolation of sodium metasilicate is processed to isolate calcium metasilicate, from which is obtained another valuable raw material -- carbonized calcium metasilicate.

All these products were for the first time obtained from nepheline syenites. Aside from alumina, portland cement, and soda and potash, the other products are more or less essentially new industrial products, and therefore complete technological cycles have been worked out for their production as well as for the apparatus required, and studies were performed to optimize their utilization and to clarify the expediency and economy of obtaining and utilizing these products.

The development of such an intricate but minutely integrated chemico-technological production scheme and the verification of its every detail on a laboratory, large-laboratory, and semi-industrial scale, and also the investigation and development of optimal techniques and paths of a comprehensive utilization of all the resulting products, involved a great deal of creative labor by M. G. Manvelyan and the entire staff of the Institute of Chemistry, Academy of Sciences Armenian SSR.

The nomination of names of the scientists associated with this remarkable project for the Lenin's Prize has met with ardent approval by the scientific public of our republic. Let us wish them further successes in their creative constructive labor for the benefit of our Homeland.

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INCREASING PRODUCTION AT THE KAFAN COPPER ORE COMBINE

[Following is a translation of an article by G. Ovanesyan in the Russian-language newspaper Kommunist, Yerevan, 14 Feb 63.]

Produce more copper, and at less cost at that, for the country -- such is the principal task which the Party members and all miners at the Kafan Copper Ore Combine are struggling to accomplish. And they are indeed accomplishing it, by increasing the capacity of the existing enterprises, efficiently operating equipment and machinery, and improving production processes. Since the November Plenum of the CC CPSU these problems have been lying in the center of attention of the Party committee. We constantly remind the secretaries of Party locals and the activists of the need to boldly make way for progress, to encourage initiative and bold technical ideas.

Our mines are growing each year and their ore extraction is increasing. But the concentrator factory does not keep in step. What is the way out? The Party members-flotation workers answered this question. They suggested exploring the possibilities for increasing beneficiation within the same production space. We gave them our wholehearted support. Concrete measures were drafted at a meeting of the Party committee, to which were invited shockworkers, engineers, and technicians. These measures were approved by the management of the combine and by the sovnarkhoz.

The concentrator factory installed yet another pulverizer, thus increasing its productivity by nearly 10 percent. This means that in 1963 the factory will produce much more than it did in the previous year. The qualitative indexes, too, attest that the flotation members rank at the top of the list for the country as a whole.

Here is another example of the concern of Party members for production. Since early 1963 the mine No. 1-2 had been lagging, underfulfilling its tasks. Members of the Party committee visited the mine and talked to workers and specialists. It turned out that mechanization and progressive working techniques were underestimated at this mine. This problem also became a subject of discussion to the Party organization. The comrades recommended to the mine management that it should improve the maintenance of equipment and raise the skills of workers, with emphasis on cross-training. We took under our aegis the activities of the technical study clubs, and inspected the performance of the agitators and activists from the trade-union local. This has led to intensifying the mass-political work. Fulfilling the decisions of the Party committee and the local Party unit, the management equipped the mine with new loaders and more capacious mine cars. Owing to these measures, labor productivity in the loading and transloading of ore was tripled.

The struggle for technical progress is primarily a struggle to raise labor productivity through the introduction of the achievements of science and advanced know-how. Proceeding from common interests, the Party committee and the management drafted a plan of technical modernization of production, improvements in technology, and mechanization of labor-consuming processes. On the initiative of the Party committee, a delegation of Kafan miners departed for the Khrustal'nyy Mine in the Primorskiy Sovnarkhoz, to study the advanced know-how of this enterprise. On returning home, the members of the delegation had a number of instructive talks with their co-workers. This concerned the level of work, proper care of machinery, and elimination of bottlenecks on individual production sectors. We were given technical assistance by the workers of the Mining Institute, Academy of Sciences USSR, and the Mining and Metallurgical Scientific Research Institute of the Sovnarkhoz Armenian SSR.

The propagation of advanced know-how was assisted by a special conference devoted to this important problem. At this conference the miners were told about the advanced operating techniques and new equipment and how these are being employed at other mines in the nation. The leader of drillers' brigade Hero of Socialist Labor A. Melkonyan, and the leader of the complex deep drilling brigade V. Samosvatov, and other masters of high labor productivity, transmitted their experience. The experience of the innovators

is being described in special exhibits and "rationalizers' corners."

The creative atmosphere among the collective has prepared the soil for the growth of technical progress. The Party members, chief of the Mine imeni Komsomol E. Danielyan and technical instructor G. Chobanyan, improved the technological process, thus leading to an appreciable rise in labor productivity on the stopes and decline in the consumption of mine timber and other materials. In the combine as a whole during 1962 65 labor-saving suggestions were adopted and led to savings calculated at 137,000 rubles annually. To stimulate the creative spirit of the collective, the Party units at the mines and shops provide every support to workers and specialists in translating their new technical ideas into reality. In this field the rationalization bureaus at the mines are doing useful work.

At the sessions of the Party committee, production problems associated with technical progress are a regular subject of discussion. The plans of this committee provide for reports by chiefs of mines and shops and by secretaries of local Party units.

The collective of the combine satisfactorily fulfilled the plan for 1962. The target as to labor productivity was overfulfilled. The ore extraction cost was cut by 29 percent. Following the example of the Yerevan machine builders, the miners joined the competition for higher indexes in 1963. And the tone in this work is set by the Party members -- those active leaders in introducing advanced working techniques.

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HISTORY OF THE SOVIET DIAMOND INDUSTRY

[Following is a translation of a review by S. Ustinov in the Russian-language periodical Referativnyy Zhurnal Gornoye Delo (Abstracts Journal/Mining), Moscow, No 1, 1963, pp 6-7, of an article by I. I. Kurenkov entitled "From the Initial Operating Experience of the Diamond Industry" in the Russian-language periodical Nauchn, Soobshch, In-t Gorn. Dela im. A. A. Skochinskogo (Scientific Notes. Institute of Mining imeni A. A. Skochinskiy), 1962, Vol 13, pp 129-42.]

The development of the Soviet diamond industry dates from 1938. Prospecting had been partly performed by individuals, on the basis of manual labor. The prospecting pits usually were about 10 meters deep and had a rectangular cross section; ore was hoisted by hand-winch and bucket, and transported in barrows. Initially the operations were done mostly at deposits of spoon-shaped type, which contained leached coarse-grained material. Until 1946-1948 the concentration of diamond ores was performed by primitive techniques. The overburden-stripping and mining operations were performed by means of single-bucket excavators. The extracted ore was delivered by dump trucks to concentrator factories. There was no on-the-spot primary concentration and sorting of the ore. Due to the freezing of the ore, year-round mining was abandoned in favor of seasonal mining. Beginning with 1949-1951, every exploitation operation was performed by the hydraulic method, and overburden stripping -- by excavators and later also by heavy-duty bulldozers. The hydraulic method of mining the sands and transporting them to the factory proved to be 40 percent cheaper than the excavator method. During 1949-1950, for the first time in

world practice, tests of a low-displacement dredge were carried out. The tests showed that the drainage method of developing the fluvial and river-bank diamond deposits is the most productive and economical. Considerable work was done to increase dredge productivity. In the process, effective techniques were developed for disintegration during jigging, a sub-screen method of concentrating the heavy fraction was worked out, a method of final concentration by special automatic devices was developed, and various other measures were carried out.

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MEANS OF RAISING LABOR PRODUCTIVITY AND IMPROVING THE TECHNICAL-ECONOMIC INDICES IN THE UNDERGROUND MINING OF ORE DEPOSITS

[Following is a translation of a review by S. Ustinov in the Russian-language periodical Referativnyy Zhurnal Gornoye Delo (Abstracts Journal. Mining), Moscow, No 1, 1963, pp 7-8. of an article by L. Ye. Zubrilov entitled " Means of Raising Labor Productivity and Improving the Technical-Economic Indices in the Underground Mining of Ore Deposits' in the Russian-language publication Osnovn. Vopr. Razvitiya Gornodobyvayushchey Prom-sti Orenburgsk. Ekon. R-na (Principal Problems of Development of the Mining Industry of the Orenburgskiy Economic Region), Sverdlovsk-Orenburg, 1959, pp 57-64.]

To raise labor productivity and improve technical-economic indexes, in the near future much will be accomplished to expand the introduction of the highly efficient mining systems based on ore breaking by borehole-implanted blasting charge, as applied to steeply dipping ore bodies, and of room-and-pillar systems involving the use of heavy-duty self-propelled equipment, in gently dipping deposits. The equipping of mines will be expanded by organizing the production of improved drilling machines with plunging drills, diamond-drilling machines, and high-speed percussion drills. The production of the following other equipment also will be organized: scraper winches with ratings of as much as 100 kilowatts, subterranean excavators with buckets accommodating as much as one cubic meter, self-propelled loaders, large-capacity mine cars (10 to 25 tons), contact electric locomotives with trailing weight of 20 and 30 tons, and other equipment. Auxiliary processes will be mechanized and automated. A higher labor productivity in the mines can be

achieved by cross-training in skills. At present tests of more powerful explosives are under way, and the production of electric short-time-delay detonators and other improved means of blasting is increasing. Technical-economic calculations established the economic expediency of raising the height of mine blocks. Further the author dwells on the problems of further development of underground mining at the Kumanskoye Gold Deposit, the Gay Copper-Zinc Deposit, and the Blyavinskoye Copper Deposit.

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DEVELOPMENT OF THE ZYRYANOVSK POLYMETAL DEPOSIT

[Following is a translation of a review by G. Butkevich in the Russian-language periodical Referativnyy Zhurnal. Gornoye Delo (Abstracts Journal. Mining), Moscow, Jan 1963, No 1, p 52, of an article by V. F. Rybart and V.F.Makarevich entitled "The Zyryanovsk Quarry" in the Russian-language periodical Tr. Altaysk. Gornometallurg. N.-I. In-ta (Works of the Altay Mining and Metallurgical Scientific Research Institute), No 13, 1962, pp 5-12.]

In 1965 the construction of the open-strip pit began at Zyryanovsk to develop the upper horizons of this polymetal ore deposit, previously mined by the underground method. The ores are impregnated in the microquartzites and sericite-chlorite schists with a strength factor of 6-16 on the scale of Professor M. M. Protod'yakonov. The overburden consists of rocky and friable argillaceous and sand-pebble deposits. The overburden is loosened by borehole-blasting methods; BU-2 and BU-20-2M cable-percussion drilling machines are used. The boreholes are drilled in a row spaced four to five meters apart. Fifteen to twenty holes are blasted simultaneously. The explosives are ammonites No 6 and No 10. Secondary crushing is performed by the small-blasthole method. Height of shelves in the pit: 10 meters. The loosened overburden is loaded onto dump trucks by SE-3 and EKG-4 excavators. A single excavator can load as much as 1,300 cubic meters per shift, and a single YaAZ-210E dump truck can carry 100 cubic meters, making a 1.5-kilometer trip. Hydraulic mechanization methods also are employed in overburden stripping. The washed-out rock slurry is pumped through pipes with diameters of 450, 600, and 800 millimeters and dumped at the other end. The slurry dump is sectionalized. The dump trucks construct dikes by discharging

the overburden loaded onto them by excavators. The cost of stripping one cubic meter of overburden by the hydraulic method is 0.40 ruble.

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DEVELOPMENT OF THE GAY COPPER-ZINC DEPOSIT

[Following is a translation of a review by S. Ustinov in the Russian-language periodical Referativnyy Zhurnal. Gornoye Delo (Abstracts Journal. Mining), Moscow, No 1, Jan 1963, p 53, of an article by A. N. Shilin entitled "Ways of Developing the Gay Deposit" in the Russian-language publication "Principal Problems of Development of the Mining Industry of the Orenburgskiy Economic Region," Sverdlovsk-Orenburg, 1959, pp 64-67.]

The Gay Copper-Zinc Deposit, located in Orenburgskaya Oblast, is represented by five ore bodies traced to an extent of more than three kilometers in length at from 600 to 800 meters below ground surface. They are mantle-shaped lenticular bodies overlain by 50 meters thick friable argillaceous deposits and underlain by hard rocks. Body No 3 is of the greatest interest: it contains 90 percent of the explored reserves of copper and can be worked by the open-strip method down to a depth of 400 meters, with an overburden coefficient of 14 m^3/m^3. To expedite the extraction of the rich ores concentrated in the center of body No 3,200 to 250 meters below ground surface, it will be mined by the underground method concurrently with the open-strip mining. A bucket-wheel excavator with conveyer transport, with a capacity of 3,000 cubic meters per hour, will be used on the Gay Open-Strip Pit, as will be heavy-duty EKG-8 power shovels. The excavated rock will be loaded through a feed bin and a portable crusher onto conveyers. Trenches will be excavated by a walking Uralmashzavod excavator with a 15-cubic-meter scoop and a 75 meters long boom, and ore will be extracted by EKG-4 excavators and transported by 25- and 40-ton dump trucks. The beneficiation of the Gay concentrates and high-grade ores will be performed at the currently operating Ural plants.

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DEVELOPMENT OF PLACER DEPOSITS BY THE HYDRAULIC METHOD

[Following is a translation of a review by A. Gal'perin in the Russian-language periodical Referativnyy Zhurnal. Gornoye Delo (Abstracts Journal. Mining), Moscow, No 1, Jan 1963, p 56, of an article by A. D. Alekseyev entitled "Determining the Productivity of the Hydraulic Excavator and the Consumption of Water When Developing Placer Deposits by the Hydraulic Method" in the Russian-language periodical Tr. Tsentr. N.-I. Gornorazved. In-ta (Works of the Central Scientific Research Mining-Prospecting Institute), No 47, 1962, pp 17-28.]

This central institute (TsNIGRI), in collaboration with the Isakovskoye Placer Deposit Administration, performed studies of the relationship between the productivity of the hydraulic excavator and the head and flow rate of water in nozzles of different diameters. The conditions for an efficient operation of the hydraulic excavator were determined, particularly the optimal values of pressure heads for developing Ural-type placer deposits containing 60 to 85 percent silt-clay fractions, and it was also established that the rate of flow of water on transporting the disintegrated rock is directly proportional to distance of transportation.

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BENEFICIATION OF GOLD-BEARING ORES WITH CARBONACEOUS OR GRAPHITIZED SHALES

[Following is a translation of a review by E. Shifrina in the Russian-language periodical Referativnyy Zhurnal. Gornoye Delo (Abstracts Journal. Mining), Moscow, No 1, 1963, p 7, of an article by A. A. Shakhova and R. A. Nizamutdinova entitled "Beneficiation of Gold-Bearing Ores Containing Carbonaceous or Graphitized Shales", in the Russian-language periodical Tr. Tsentr. N.-I. Gornorazved. In-ta (Works of the Central Scientific Research Mining-Prospecting Institute), No 36, 1960, pp 122-126.]

This central institute (TsNIGRI) investigated two cascade-deposit samples from the Saralinskoye Mine, collected from the oxidized and sulfide zones. The following beneficiation methods were investigated: cyanidation of entire ore; flotation of ore, followed by separate cyanidation of concentrate and tailings; flotation followed by isolation of carbonaceous concentrate and cyanidation of tailings. In every case the free gold at the beginning was recovered by jigging. The jigging concentrate was amalgamated, and the amalgamation tailings were cyanided. The best results -- recovery of Au 93.4 percent and Ag 77.9 percent -- were achieved, in the case of oxidized ore, by the first method, and in the case of the sulfide ore (Au recovery 90.95 percent), by the second method. The flotation of blended ore (60 percent oxidized plus 40 percent sulfide ores) was investigated. The obtained concentrate, with a high content of Ag and Au, is recommended for shipment to a pyrometallurgical plant. The flotation tailings, containing 1.8 grams of Au per ton, have to be cyanided (Au recovery: 83 percent). The method involving the isolation of the carbonaceous concentrate is recommended for the blended ore.

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